

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 10 NOV 2003

WIPO

PCT

Applicant's or agent's file reference	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IEPA/416)	
010104WO		
International application No.	International filing date (day/month/year)	Priority date (day/month/year)
PCT/US02/08733	22 March 2002 (22.03.2002)	23 March 2001 (23.03.2001)
International Patent Classification (IPC) or national classification and IPC		
IPC(7): H04B 7/08; H04B 7/06; H04L 1/06 and US Cl.: 375/267, 219, 347		
Applicant		
QUALCOMM INCORPORATED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
23 October 2002 (23.10.2002)	24 October 2003 (24.10.2003)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230	Authorized officer Phuong Phu <i>Karen L. Ward</i> Telephone No. 703-308-0158

Form PCT/IEPA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US02/08733

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed.
- ☒ the description:
pages 1-32 _____ as originally filed
pages NONE _____, filed with the demand
pages NONE _____, filed with the letter of _____.
- ☒ the claims:
pages 33-40 _____ as originally filed
pages NONE _____, as amended (together with any statement) under Article 19
pages NONE _____, filed with the demand
pages NONE _____, filed with the letter of _____.
- ☒ the drawings:
pages 1-8 _____, as originally filed
pages NONE _____, filed with the demand
pages NONE _____, filed with the letter of _____.
- ☐ the sequence listing part of the description:
pages NONE _____, as originally filed
pages NONE _____, filed with the demand
pages NONE _____, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US02/08733**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>2-6,9,11,12,15,16,18-24,26-28,31-38,40-44</u>	YES
	Claims <u>1,7,8,10,13,14,17,25,29,30,39</u>	NO
Inventive Step (IS)	Claims <u>2-6,9,11,12,15,16,18-24,26-28,31-38,40-44</u>	YES
	Claims <u>1,7,8,10,13,14,17,25,29,30,39</u>	NO
Industrial Applicability (IA)	Claims <u>1-44</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Please See Continuation Sheet

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US02/08733

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

V. 2. Citations and Explanations:

Claims 1, 7, 8, 10, 13, 14, 17, 25, 29, 30 and 39 lack novelty under PCT Article 33(2) as being anticipated by Raleigh (WO 98/09381).

As per claims 1 and 39, see figures 6A, 6B and 7, and page 11, line 24 to page 19, line 28 and page 21, lines 1-21, Raleigh discloses a method and associated system (figure 6A) comprising a transmitter (B) and receiver (S), as claimed, for exchanging channel state information (CSI) (see also figure 7 and page 21, lines 1-21).

As per claim 7, Raleigh discloses that the CSI comprises characterizations of channels (see page 15, lines 6-24).

As per claim 8, Raleigh discloses that the CSI is indicative of values of channels (see page 14, line 5 to page 15, line 4).

As per claim 10, Raleigh discloses that data on each channel is independently coded (see figure 7, and page 15, line 26 to page 16, line 7).

As per claim 13, Raleigh discloses that the CSI is transmitted from the receive unit (see page 21, lines 1-21).

As per claim 14, Raleigh discloses that the CSI is periodically transmitted and updated from the receiver unit (see page 19, lines 6-21).

As per claims 17 and 25, Raleigh discloses that the CSI is derived at the receiver based on a processing (see figure 7).

As per claim 29, Raleigh discloses that the system is implemented with a frequency modulation (see page 15, line 31 to page 16, line 7).

As per claim 30, Raleigh discloses that processing at each of the receiver and the transmitter is performed for each of a plurality of frequency subchannels (see figure 7).

Claims 2-6, 9, 11, 12, 15, 16, 18-24, 26-28, 31-38 and 40-44 meet the criteria set out in PCT Article 33(2)-(4).

As per claims 2-5, as applied to claim 1, Raleigh discloses the claimed method except that he fails to further disclose that the report CSI comprises signal-to-noise-plus-interference ratio (SNR) estimates for each of the plurality of transmission channels, as recited in claim 2. It would not have been obvious for one skilled in the art to combine Raleigh with other prior art of record in order to arrive at the claimed invention.

As per claim 6, as applied to claim 1, Raleigh discloses the claimed method except that he fails to further disclose means for modulating coded data for each transmission channel in accordance with modulation scheme selected based on the SNR estimates for the transmission channel. It would not have been obvious for one skilled in the art to combine Raleigh with other prior art of record in order to arrive at the claimed invention.

As per claim 9, 11 and 12, as applied to claim 1, Raleigh discloses the claimed method except that he fails to further disclose means for coding data for transmission channels based on eigenvalues derived from the received CSI, as recited in claim 9. It would not have been obvious for one skilled in the art to combine Raleigh with other prior art of record in order to arrive at the claimed invention.

As per claim 15, as applied to claim 1, Raleigh discloses the claimed method except that he fails to further disclose that the CSI is transmitted when changes in the channel characteristics exceeding a particular threshold are detected. It would not have been obvious for one skilled in the art to combine Raleigh with other prior art of record in order to arrive at the claimed invention.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US02/08733

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

As per claim 16, as applied to claim 1, Raleigh discloses the claimed method except that he fails to further disclose that the CSI indicative of eigenmodes and eigenvalues are transmitted at different update rates. It would not have been obvious for one skilled in the art to combine Raleigh with other prior art of record in order to arrive at the claimed invention.

As per claims 18-24, Raleigh fails to teach filtering means and multiplying means associated with limitations as recited in claim 18. It would not have been obvious for one skilled in the art to combine Raleigh with other prior art of record in order to arrive at the claimed invention.

As per claims 26-28, Raleigh fails to teach multiplying means associated with limitations as recited in claim 26. It would not have been obvious for one skilled in the art to combine Raleigh with other prior art of record in order to arrive at the claimed invention.

Claims 31-38 meet the criteria set out in PCT Article 33(2)-(4) with similar reasons set forth above for claims 2-5.

As per claims 40-44, none of prior art of record teaches or suggests a method comprising filtering means and multiplying means associated with limitations as recited in claim 40.